



State of Utah

DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER QUALITY

M/047/007

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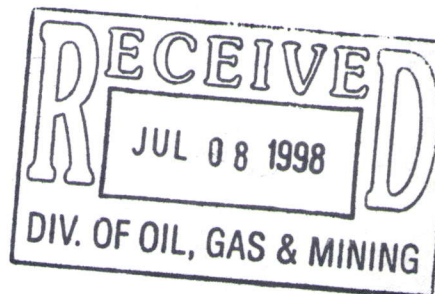
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July 7, 1998

Mr. Ronald Ryan
SF Phosphates Limited Company
9401 North Hwy. 191
Vernal, UT 84078-7802

Dear Mr. Ryan:

Subject: Ground Water Discharge Permit Application, **Tailings Pond Expansion**, Permit No. UGW470001

I have reviewed your recent permit application for an expansion of the SF Phosphate mine's tailings pond. You propose that the tailings slurry water is of compatible quality with the receiving ground water, and so it is not necessary to line the impoundment. We will need additional information, as discussed below, to determine whether this can be used as a basis for permit issuance. Also, permit conditions will need to be developed to assure that operation of the facility will not cause ground water pollution. In order to insure that the permit contains appropriate conditions for this site, the following areas need to be addressed before we can write a draft permit:

1. Waste Characterization

We need to know if any constituents are present in the tailings or the associated slurry water which could potentially degrade ground water quality. Data which you have supplied indicates relatively high levels of arsenic, chromium and nickel in some of the tailings solids. Other metals or toxic constituents may also be associated with the phosphate ore, for example uranium, radium-226 or fluorine. If any such constituents are present in the waste which may cause degradation of ground water quality, they must be reported. Analyses for Gross Alpha or other radiologic parameters in water should use methods which are appropriate for the dissolved-solids content of the water. Also, tests should be conducted on the tailings solids which simulate the effects of weathering over time, to determine whether there is a risk of releasing toxic contaminants after closure of the facility.

2. Waste Containment

In your application you state that slurry walls have been installed downgradient of the tailings dam to prevent seepage from flowing into Big Brush Creek through the alluvium underneath the dam. Please submit plans for these structures, and also show their relationship to the eventual planned enlarged tailings dam. Seepage beneath the dam must not significantly affect water quality in Big Brush Creek. As a permit condition, the effectiveness of these structures may need to be monitored.

3. Permissible Wastes

Only tailings and associated slurry water may be stored in the impoundment. Untreated sewage may not be discharged into the impoundment as you propose in your application.

4. Compliance Monitoring

The permit's monitoring plan must demonstrate that waters of the state are not being contaminated by operation of the tailings facility. Because you have chosen to dispose of the tailings in an unlined impoundment, the monitoring plan must cover any areas around the site where there is a potential for ground or surface water pollution. Based on what is currently known about the chemical quality of the wastewater, the main concerns for water pollution are from excessive salts affecting ground water or surface water with low salt content. Other contaminants may be revealed by the waste characterization required in item (1) above.

The majority of the area underneath the existing and planned tailings impoundment is underlain by the Moenkopi Shale. This formation is not an aquifer, and what ground water it does contain is of poor quality. However, the presence of water in the impoundment and the higher hydraulic head which the dam will cause will tend to force more water through the shale. This may lead to poorer-quality water being discharged into higher-quality ground water aquifers or to surface water. Also, it may lead to increased dissolution of gypsum and increased permeability within the Moenkopi Shale.

Part of the tailings impoundment overlies the Shinarump Conglomerate. There is a possibility that tailings water recharging into the Shinarump may enter into a fracture-flow system within the conglomerate and eventually affect water quality in other aquifers or surface water bodies.

In order to support the rationale behind a proposed compliance monitoring well system, hydrogeologic studies should determine whether tailings water which infiltrates into the ground anywhere within the footprint of the impoundment can affect ground or surface water quality. This evaluation should take into account leaching of salts from the Moenkopi and other formations and discharge of ground water to Big Brush Creek. Monitor well locations should be proposed which enable us to evaluate any effects on ground water quality. Monitoring the quality of the tailings water or of surface water may also be used to demonstrate compliance, if appropriate. Monitor well construction must follow the criteria in the RCRA Technical Enforcement Guidance Document (OSWER 9950.1).

You must also identify the background ground water quality at locations which may be affected by the impoundment. Because ground water quality within the Moenkopi Formation may be highly variable, it may be appropriate to define background water quality in downgradient monitor wells, provided they have not already been affected by seepage from the existing impoundment. We would prefer to use data from at least eight sampling events taken over a one-year period to establish background water quality and determine protection levels. Background water quality sampling may be done after permit issuance if necessary. If, after the appropriate hydrogeological studies have been completed, you propose to use existing monitor wells for permit compliance monitoring, existing data may be used to determine background water quality. The wells must be properly constructed to allow this. In this case, please forward all the water quality data collected from any existing wells which you propose to use for compliance monitoring.

Discharge from the impoundment must not cause significant degradation of water quality in Big Brush Creek. The monitoring program must be able to evaluate the impact of the tailings impoundment on the creek. This may be accomplished by some combination of ground water monitoring, surface water monitoring or other methods.

You must propose a monitoring system which will accomplish these goals. The program may be designed considering your knowledge of the site characteristics and your mining operation. We are flexible in approving an appropriate monitoring plan provided these goals are met.


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5. Closure

Although closure of the facility will probably not happen in the near future, or during the term of the permit, you should propose language for the permit, the permit will need to contain a provision which commits the company to take appropriate actions to prevent ground and surface water pollution after facility closure. Some of these actions may take place during operation of the facility, such as testing of the tailings materials for the potential to release pollutants as they weather. When the characteristics of the tailings materials are known, an appropriate plan for reclaiming the impoundment and preventing water pollution may be developed.

Please contact me if you have any questions on these matters. If necessary we can schedule a meeting to discuss them. Also, please keep us informed of your needs for construction scheduling and other deadlines. In some cases, the permit may be issued before all the additional information listed in this letter has been developed. If this is necessary, reporting some of this information to us would be included as "compliance schedule" items in the permit, due at some future date.

Sincerely,



Mark Novak, Environmental Scientist
Ground Water Protection Section

MN:mtn

cc: Uintah Basin Health Dept.
Ted Allen, District Engineer
Wayne Hedberg, DOGM
Don Hilden
Kiran Bhayani
Loren Morton, DRC

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